Ground Rules

* Metrology
  - measurement
  - science
* Systems of Units
  - SI (International System)
  - US (Customary British Conventional)

Variables

Basic:
- length: meter [m] ↔ foot [ft] (100 cm ≈ 1 in 2.54 cm; 12 in = 1 ft)
- mass: kilogram [kg] ↔ Slug [lbm] (1 kg = 2.2 lbm; pound-mass)
- time: second [s] (sec)

Derived:
- force: Newton [N] ↔ pound-force [lbf]
- energy: Joule [J] (force * distance) ↔ foot-pound-force [ft-lbf]
- power: Watt [W] (energy / time) ↔ ft-lbf/sec (1 hp = 746 W)
- temperature: Kelvin [K] (0 K = -273 °C) ↔ Rankine [R] (°F)
- pressure: Pascal [Pa] ≡ 1 N/m² ↔ lbf/ft²

Multiples of Units

Scientific Notation

eg SI : meter (m)

1 kilometer = 1,000 m = $1 * 10^3$ m

1 meter = 1 m

dm = 1 decimeter = $\frac{1}{10}$ m = 0.1 m = $1 * 10^{-1}$ m

cm = 1 centimeter = $\frac{1}{100}$ m = 0.01 m = $1 * 10^{-2}$ m

mm = 1 millimeter = $\frac{1}{1,000}$ m = 0.001 m = $1 * 10^{-3}$ m

μm = 1 micrometer = $\frac{1}{1,000,000}$ m = 0.000001 m = $1 * 10^{-6}$ m

hm = 1 hanometer = $1 * 10^{-9}$

How to express your answer

US system

length: foot [ft), ['] inch [in.], ["]

e.g. 2 ft 5 in

$= 2' 5''$

$= 2' + \frac{5}{12}' = 2.417'$,

$= 2\frac{5}{12}'$, $2 \cdot \frac{5}{12}$, $2 - \frac{5}{12}$, $2 \div \frac{5}{12}$

$= 2' 5'' = 2(12) + 5''$

$= 24 + 5 = 29''$

Decimal

2 ft 5 in = 2.417 ft ✓

= 2.417 ft ✗